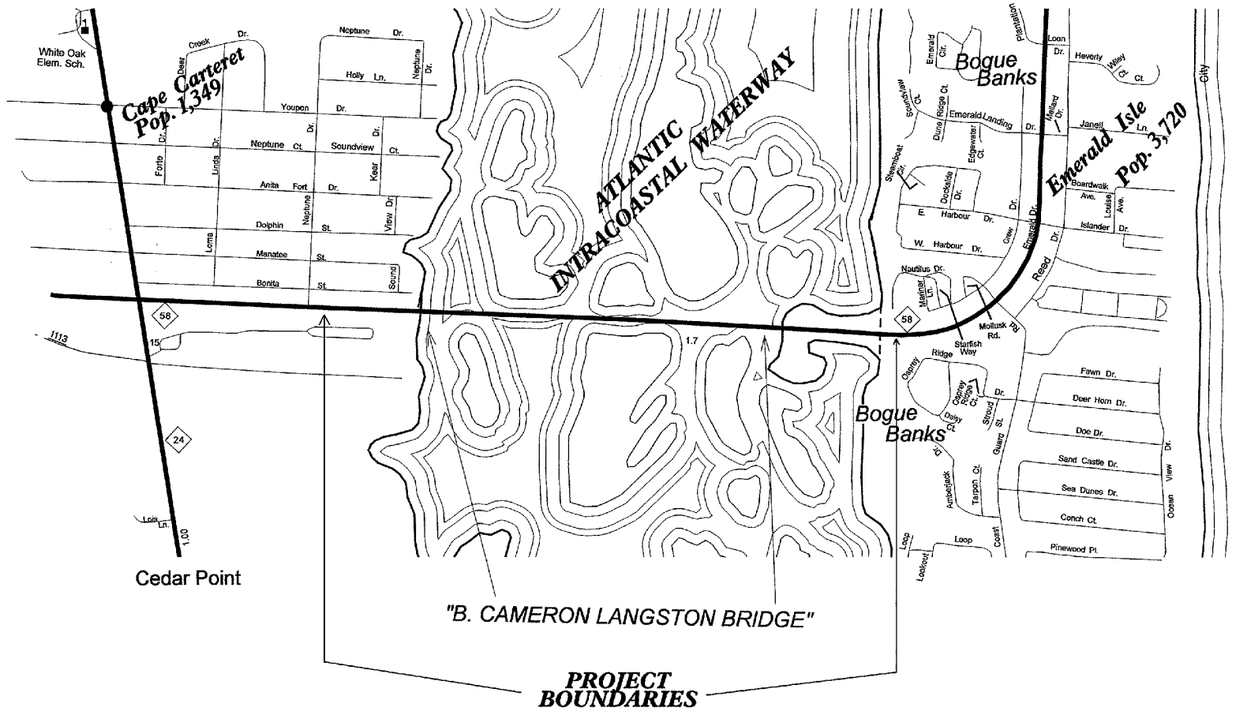
PROJECT REFERENCE NO.	SHEET NO.
SS 4902AB	ITS 1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CARTERET COUNTY

LOCATION: NC 58 BRIDGE IN CAPE CARTERET
TYPE OF WORK: ADVANCED QUEUE DETECTION WARNING SYSTEM



LEGEND

- NEW CONDUIT
- EXISTING GUARDRAIL/GUARDRAIL BY OTHERS
- NEW STANDARD SIZE JUNCTION BOX
- EXISTING JUNCTION BOX
- NEW WOOD POLE
- EXISTING WOOD POLE
- NEW MICROWAVE VEHICLE DETECTOR (MVD) UNIT
- NEW DYNAMIC MESSAGE SIGN (DMS) CABINET
- NEW WIRELESS SYSTEM
- NEW DYNAMIC MESSAGE SIGN (DMS) STRUCTURE (PEDESTAL)
- NEW DYNAMIC MESSAGE SIGN (DMS) STRUCTURE (STEEL POST)
- NEW ELECTRICAL SERVICE ON 6" x 6" WOOD POST

PROJECT: SS 4902AB

INDEX OF SHEETS

2006 STANDARD SPECIFICATIONS

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS". ROADWAY DESIGN UNIT – N.C. DEPARTMENT OF TRANSPORTATION – RALEIGH, N.C., DATED JULY 2006 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1700.01	ELECTRICAL SERVICE OPTIONS
1700.02	ELECTRICAL SERVICE GROUNDING
1715.01	UNDERGROUND CONDUIT
1716.01	JUNCTION BOXES

NCDOT CONTACT:

TRANSPORTATION MOBILITY AND SAFETY DIVISION
G.A. FULLER, PE – STATE ITS AND SIGNALS ENGINEER

Prepared in the Offices of:
759 N. Greenfield Pkwy., Garner, NC 27529

NC 58 ADVANCED QUEUE DETECTION WARNING SYSTEM

DIVISION 02	CARTERET CO.	CAPE CARTERET	
PLAN DATE: NOVEMBER 2009		REVIEWED BY: I.N. AVERY	
PREPARED BY: H.T. BERGGREN		REVIEWED BY: G. A. FULLER, PE	

SCALE: 0

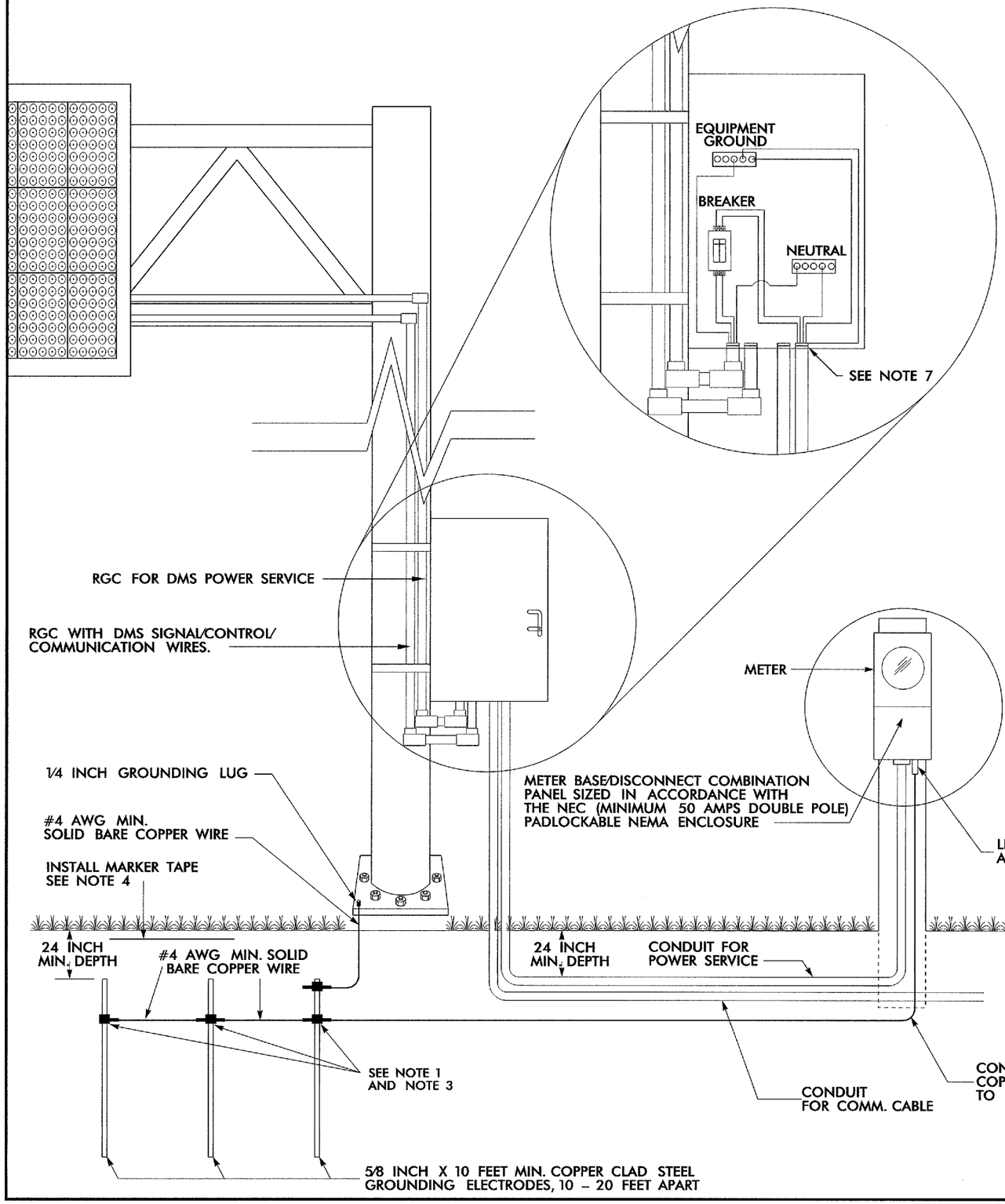
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A FULLER

Gregory A Fuller 11/23/09
SIGNATURE DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
SS–4902 AB	SIG. 2



NOTES

1. INSTALL A MINIMUM OF THREE (3) GROUND RODS SPACED A MINIMUM OF 10 FEET APART. ENSURE THAT EXISTING UNDERGROUND FACILITIES ARE NOT DAMAGED DURING INSTALLATION.
2. TEST GROUNDING SYSTEM USING AN APPROVED METHOD. SYSTEM SHOULD MEASURE TWENTY (20) OHMS OR LESS. ADDITIONAL GROUND RODS SHALL BE INSTALLED AS DIRECTED BY THE ENGINEER TO MEET THIS REQUIREMENT.
3. EXOTHERMICALLY WELD ALL CONNECTIONS TO GROUND RODS.
4. INSTALL MARKER TAPE DIRECTLY ABOVE ALL GROUNDING ELECTRODES AND CONDUCTORS AT A DEPTH OF 6 – 12 INCHES.
5. EXOTHERMICALLY WELD THE SERVICE POLE GROUND WIRE TO THE GROUND ROD SYSTEM.
6. REMOVE BONDING JUMPER IN EQUIPMENT CABINET IF INSTALLED BETWEEN AC NEUTRAL AND EQUIPMENT GROUND.
7. BOND ALL RIGID GALVANIZED STEEL CONDUITS ENTERING THE CABINET TO "EQUIPMENT GROUND".
8. INSTALL CONDUIT BETWEEN DISCONNECT AND CABINET.
9. SERVICE DISCONNECT NEUTRAL BUS BAR SHALL PROVIDE FOR 2 #4 AWG CONNECTIONS.
10. ENSURE EQUIPMENT GROUND IS ELECTRICALLY BONDED TO CABINET.

Prepared in the Offices of:
Traffic Engineering and Safety Systems Branch
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Intelligent Transportation Systems
750 N. Greenfield Pkwy., Garner, NC 27529

DYNAMIC MESSAGE SIGN
ELECTRICAL SERVICE AND GROUNDING
TYPICAL DETAIL

PLAN DATE:	AUGUST 2009	REVIEWED BY:	T.G. PARKER
PREPARED BY:	ASLAMI/YOW	REVIEWED BY:	G.A. FULLER

REVISIONS	INIT.	DATE

SCALE: 0 N/A

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER

SIGNATURE Gregory A. Fuller DATE 11/23/09

CADD FILE NAME

PROJECT REFERENCE NO.	SHEET NO.
SS-4902AB	ITS-3

SYSTEM OVERVIEW

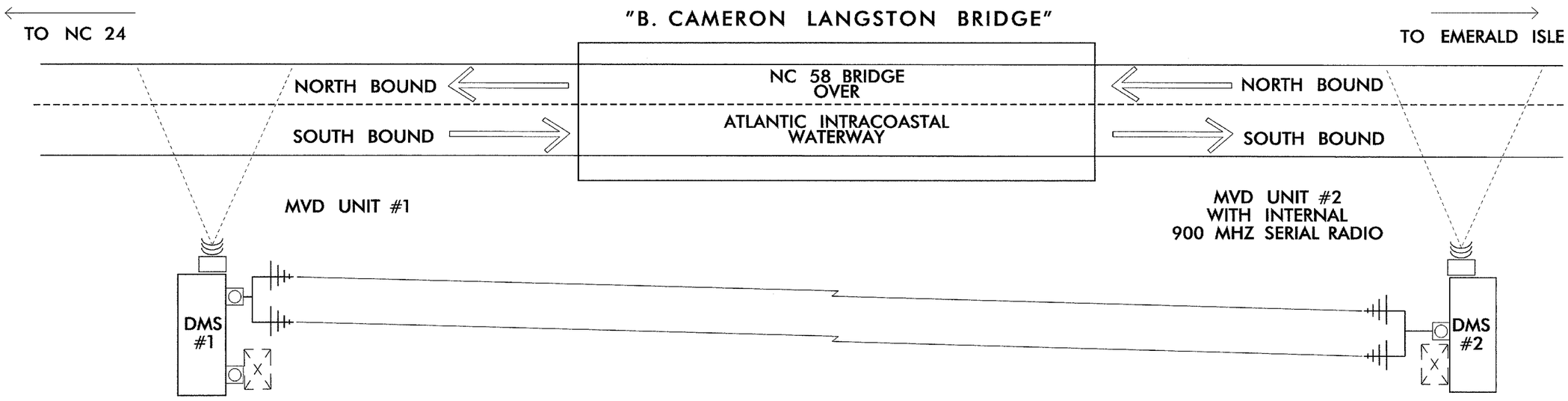
DYNAMIC MESSAGE SIGN (DMS) MESSAGES

THE FOLLOWING MESSAGES ARE PART OF THE
"ADVANCED QUEUE DETECTION WARNING SYSTEM"

HIGH PRIORITY MESSAGE (Average Vehicle Speed is 0 to 10 mph),
"STOPPED TRAFFIC AHEAD"

LOW PRIORITY MESSAGE (Average Vehicle Speed is 10+ to 30 mph),
"SLOW MOVING TRAFFIC AHEAD"

THE DIVISION VIA PHONE SERVICE SHALL BE ABLE TO OVERRIDE
THESE MESSAGES AND DISPLAY OTHER MESSAGES
WHEN NEEDED. Example "HURRICANE EVACUATION ROUTE"



MASTER LOCATION

DMS CABINET AND SIGN CONTROLLER WITH
EVENT PROCESSOR, 900 MHZ CONTACT CLOSURE
RADIO, AND 900 MHZ SERIAL RADIO.

REMOTE LOCATION

DMS CABINET AND SIGN CONTROLLER WITH
900 MHZ CONTACT CLOSURE RADIO, AND
MVD WITH INTERNAL 900 MHZ SERIAL RADIO.

NOTES:

BOTH MVD UNIT #1 AND MVD UNIT #2 SHALL DETECT ALL LANES OF TRAFFIC ALONG NC 58. THE TWO MVD UNITS WILL BE LOCATED ON OPPOSITE SIDES OF THE NC 58 BRIDGE. THE SYSTEM WILL SELECT A MESSAGE TO DISPLAY ON THE APPROPRIATE DMS BASED ON REAL-TIME DATA SENT FROM THE MVD UNITS MEETING PARAMETER CONDITIONS AS SET-UP BY THE ENGINEER IN THE EVENT PROCESSOR.

Prepared in the Offices of:
NC Department of Transportation
750 N. Greenfield Pkwy., Garner, NC 27529

SCALE: 0

SYSTEM OVERVIEW
NC 58 ADVANCED QUEUE
DETECTION WARNING
SYSTEM

DIVISION 02 CARTERET CO. CAPE CARTERET

PLAN DATE: NOVEMBER 2009 REVIEWED BY: I.N. AVERY
PREPARED BY: H.T. BERGGREN REVIEWED BY: G.A. FULLER, PE

REVISIONS	INIT.	DATE

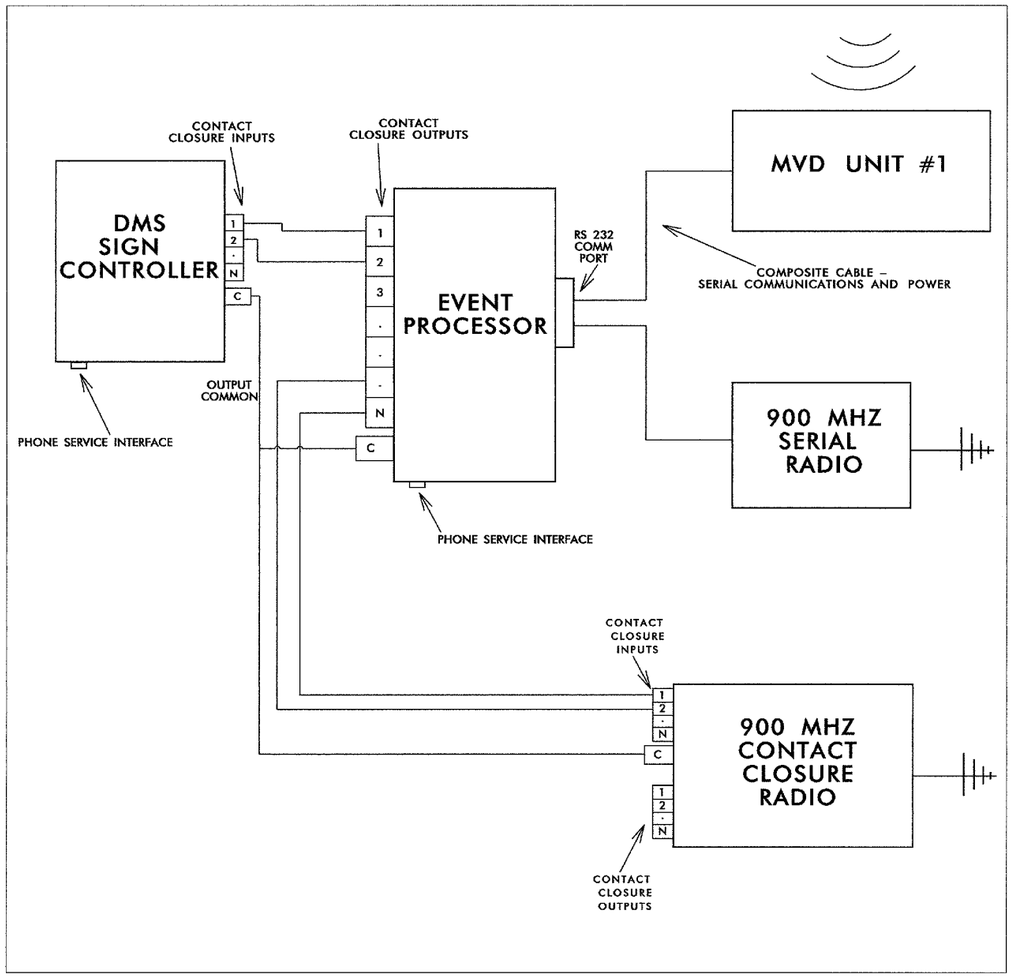
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER

Gregory A. Fuller 11/23/09
SIGNATURE DATE

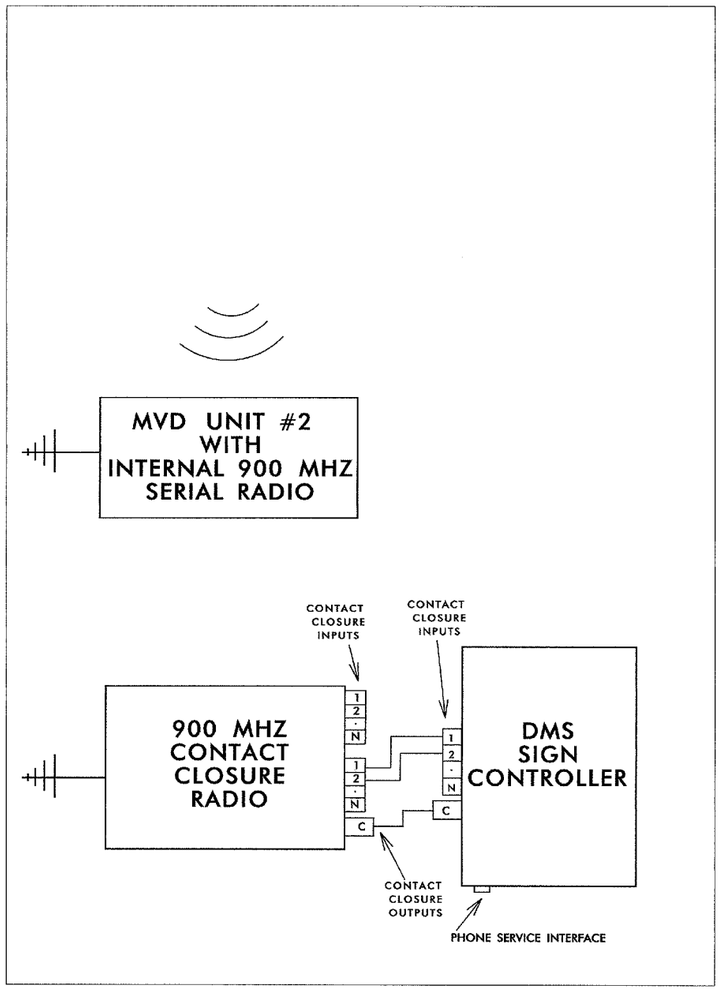
CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
SS 4902AB	ITS 4

MASTER LOCATION
NORTH SIDE OF NC 58 BRIDGE



REMOTE LOCATION
SOUTH SIDE OF NC 58 BRIDGE



Prepared in the Offices of:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION – Mobility and Safety, Integrated Transportation Systems
750 N. Greenfield Pkwy., Garner, NC 27529

SCALE: 0

BLOCK DIAGRAM
NC 58 ADVANCED QUEUE DETECTION WARNING SYSTEM

DIVISION 02 CARTERET CO. CAPE CARTERET

PLAN DATE: NOVEMBER 2009 REVIEWED BY: I. N. AVERY

PREPARED BY: H.T. BERGGREN REVIEWED BY: G.A. FULLER, PE

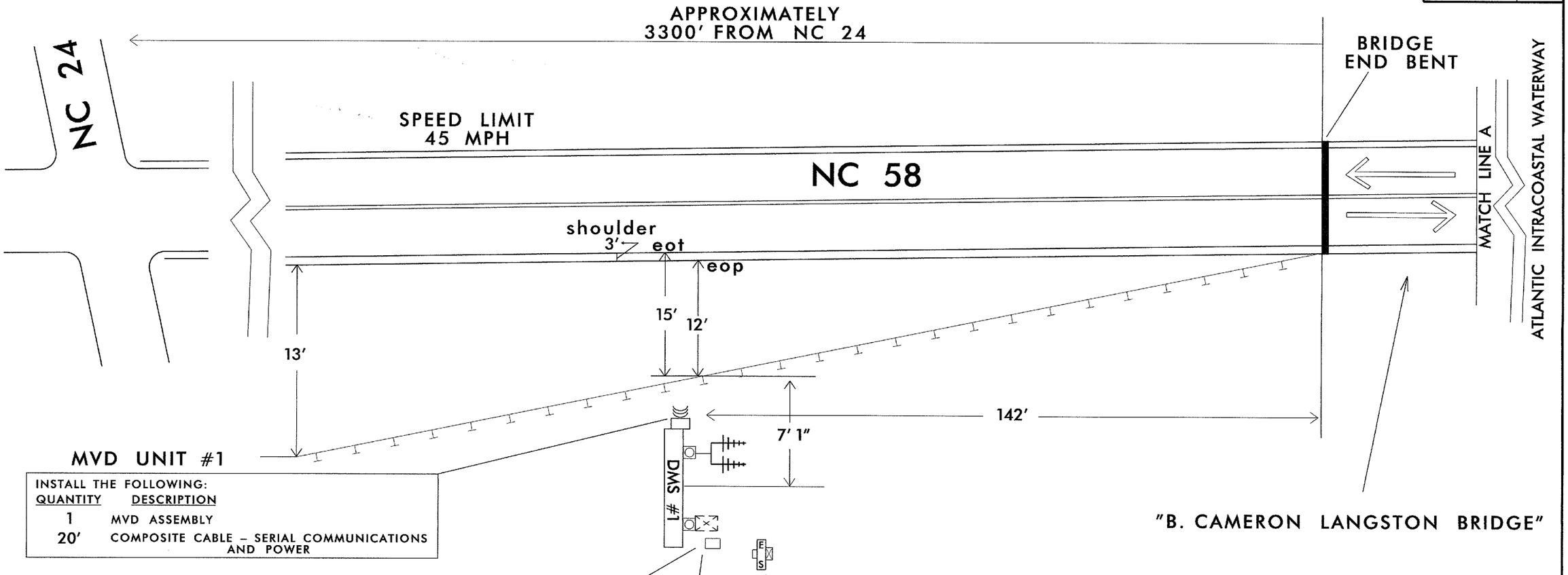
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 023919 GREGORY A. FULLER

Gregory A. Fuller 11/23/09
SIGNATURE DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
SS_4902AB	ITS 5



MVD UNIT #1

INSTALL THE FOLLOWING:

QUANTITY	DESCRIPTION
1	MVD ASSEMBLY
20'	COMPOSITE CABLE – SERIAL COMMUNICATIONS AND POWER

DMS UNIT #1

INSTALL THE FOLLOWING:

QUANTITY	DESCRIPTION
1	FOOTING FOR DMS – STRUCTURE
1	DMS 1 – STRUCTURE (STEEL POST)
1	DMS
1	INSTALL PHONE SERVICE FOR DMS

INSTALL THE FOLLOWING: ITEMS IN THE DMS CABINET

QUANTITY	DESCRIPTION
1	EVENT PROCESSOR CONTROLLER
1	900 MHZ CONTACT CLOSURE RADIO WITH ANTENNA
1	900 MHZ SERIAL RADIO WITH ANTENNA
1	INSTALL PHONE SERVICE FOR EVENT PROCESSOR CONTROLLER

ELECTRICAL SERVICE (UNDERGROUND)

INSTALL THE FOLLOWING:

QUANTITY	DESCRIPTION
1	INSTALL METER BASE/DISCONNECT PANEL
1	2" CONDUIT STUB-OUT FOR SERVICE ENTRANCE CONDUCTORS
20'	DMS FEEDER CONDUCTORS – 4-WIRE THWN #8 AWG STRANDED COPPER

MASTER LOCATION

Prepared in the Offices of:
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 N. Greenfield Pkwy., Garner, NC 27529

NC 58 ADVANCED QUEUE DETECTION WARNING SYSTEM

DIVISION 02 CARTERET CO. CAPE CARTERET

PLAN DATE: NOVEMBER 2009 REVIEWED BY: I.N. AVERY

PREPARED BY: H.I. BERGGREN REVIEWED BY: G. A. FULLER, PE

REVISIONS	INIT.	DATE

SCALE 0

CADD Filename:

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER

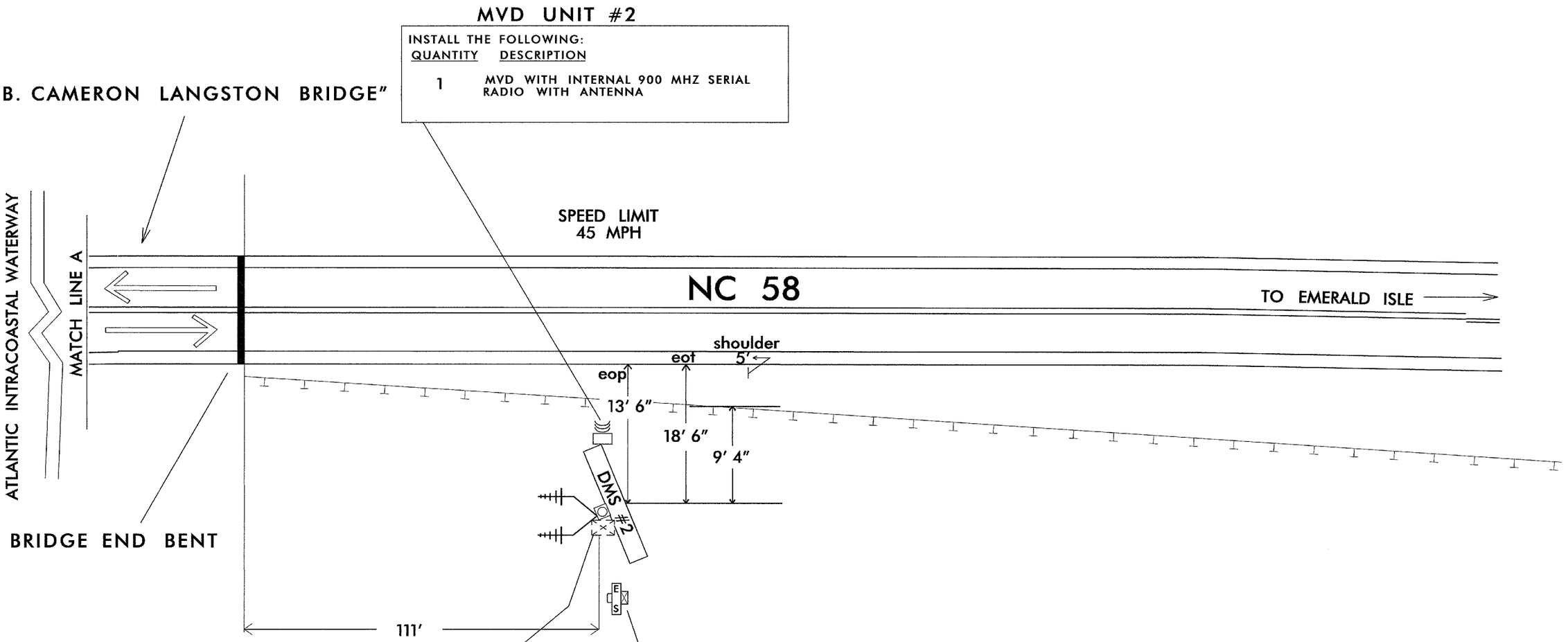
SIGNATURE DATE 11/23/09

PROJECT REFERENCE NO.	SHEET NO.
SS.4902AB	ITS.6

MVD UNIT #2

INSTALL THE FOLLOWING:

QUANTITY	DESCRIPTION
1	MVD WITH INTERNAL 900 MHZ SERIAL RADIO WITH ANTENNA



ELECTRICAL SERVICE (UNDERGROUND)

INSTALL THE FOLLOWING:

QUANTITY	DESCRIPTION
1	INSTALL METER BASE/DISCONNECT PANEL
1	2" CONDUIT STUB-OUT FOR SERVICE ENTRANCE CONDUCTORS
20'	DMS FEEDER CONDUCTORS – 4-WIRE THWN #8 AWG STRANDED COPPER

DMS UNIT #2

INSTALL THE FOLLOWING:

QUANTITY	DESCRIPTION
1	FOOTING FOR DMS – STRUCTURE
1	DMS 2 – STRUCTURE (PEDESTAL MOUNTED)
1	DMS
1	INSTALL PHONE SERVICE FOR DMS

INSTALL THE FOLLOWING ITEMS IN THE DMS CABINET

1	900 MHZ CONTACT CLOSURE RADIO WITH ANTENNA

REMOTE LOCATION

Prepared in the Offices of:
NCDOT Transportation Mobility and Safety Division
750 N. Greenfield Pkwy., Garner, NC 27529

NC 58 ADVANCED QUEUE DETECTION WARNING SYSTEM

DIVISION 02 CARTERET CO. CAPE CARTERET

PLAN DATE: NOVEMBER 2009 REVIEWED BY: I.N. AVERY

PREPARED BY: H.T. BERGGREN REVIEWED BY: G.A. FULLER, PE

SCALE 0

REVISIONS	INIT.	DATE

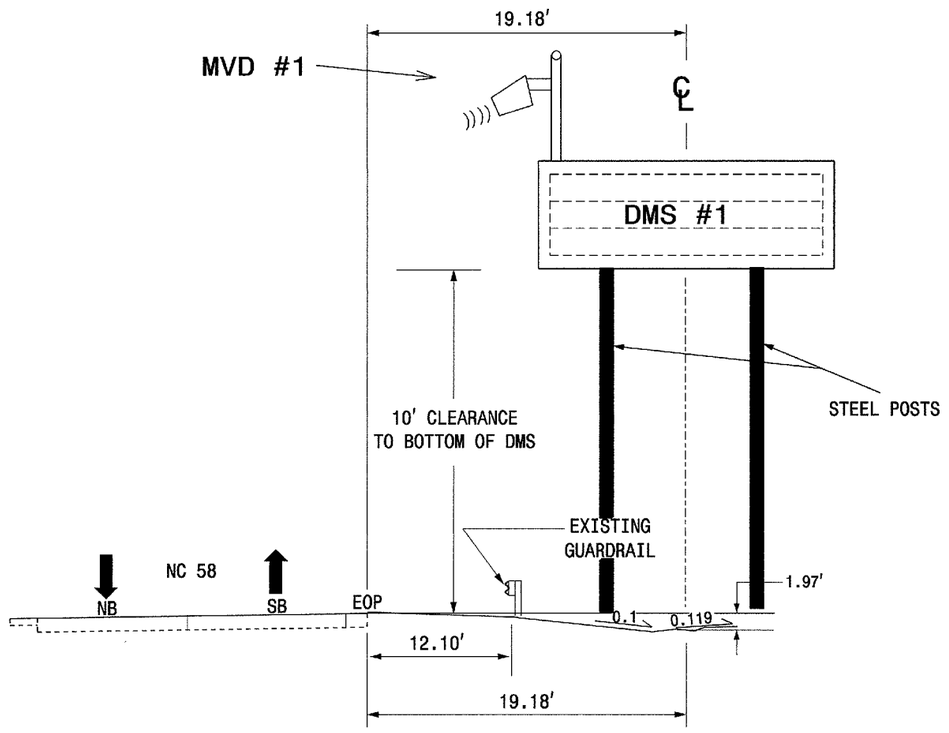
SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 023919 GREGORY A. FULLER

Gregory A. Fuller 11/24/09
SIGNATURE DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
SS 4902AB	ITS 7

ESTIMATED DIMENSION: 15′ X 8′
MAXIMUM DEAD LOAD OF 1500 LBS



NOTES:

1. DMS ATTACHMENT HEIGHT FROM HIGHWAY GRADE TO BOTTOM OF THE DMS IS APPROXIMATELY 10 FEET. DMS ATTACHMENT METHOD SHALL BE PROVIDED BY THE CONTRACTOR.
2. THE ACTUAL DIMENSIONS AND WEIGHT OF THE DYNAMIC MESSAGE SIGN WILL BE PROVIDED BY DMS FABRICATOR. SUCH DIMENSIONS WILL BE USED TO COMPLETE THE DESIGN OF THE OVERHEAD STRUCTURE.
3. FIELD VERIFICATION SHALL BE REQUIRED FOR ALL FOOTING ELEVATIONS AND GROUND SLOPES AT THE FOOTINGS, PER THE LATEST NCDOT STANDARD SPECIFICATION FOR ROADS AND STRUCTURES.
4. THE TOP OF THE FOOTING SHALL EXTEND AT LEAST 6 INCHES AND NOT MORE THAN 24 INCHES ABOVE THE HIGHEST POINT OF THE GROUND SURFACE AT THE FOOTING.
5. DESIGN AND CONSTRUCTION REQUIREMENTS FOR "STEEL POST STRUCTURE CONSTRUCTION" SHALL MEET AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS.
6. CONTRACTOR SHALL VERIFY ALL UNDERGROUND UTILITY LOCATIONS BEFORE BEGINNING ANY UNDERGROUND WORK AND SHALL NOT DAMAGE ANY EXISTING UTILITIES.
7. MOUNT THE MVD UNIT TO THE DMS STRUCTURE BY A METHOD APPROVED BY THE STRUCTURE FABRICATOR OF RECORD FOR THE DESIGN OF THE DMS STRUCTURE.
8. ENSURE THE ATTACHMENT HEIGHT AND LOCATION OF THE MVD UNIT TO THE DMS STRUCTURE MEETS THE REQUIREMENTS OF THE MVD MANUFACTURER FOR OPTIMUM PERFORMANCE OF THE UNIT.

MASTER LOCATION

Prepared in the Offices of:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Transportation Mobility and Safety Division
Intelligent Transportation Systems Section
750 N. Greenfield Pkwy., Garner, NC 27529

DMS #1 & MVD #1
NC 58 ADVANCED QUEUE
DETECTION WARNING
SYSTEM

DIVISION 02 CARTERET CO. CAPE CARTERET
PLAN DATE: NOVEMBER 2009 REVIEWED BY: I. N. AVERY
PREPARED BY: H.T. BERGGREN REVIEWED BY: G.A. FULLER, PE

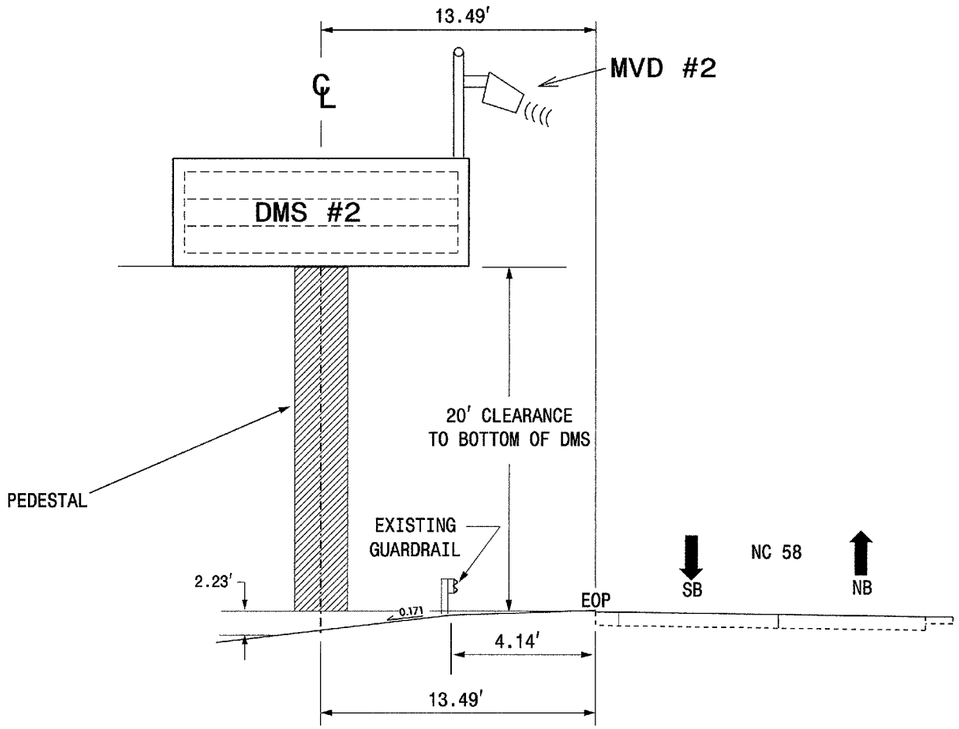
SCALE 0

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER
SIGNATURE DATE 11/23/09
CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
SS 4902AB	ITS 8

ESTIMATED DIMENSION: 15' X 8'
MAXIMUM DEAD LOAD OF 1500 LBS



NOTES:

1. DMS ATTACHMENT HEIGHT FROM HIGHWAY GRADE TO BOTTOM OF THE DMS IS APPROXIMATELY 20 FEET. DMS ATTACHMENT METHOD SHALL BE PROVIDED BY THE CONTRACTOR.
2. THE ACTUAL DIMENSIONS AND WEIGHT OF THE DYNAMIC MESSAGE SIGN WILL BE PROVIDED BY DMS FABRICATOR. SUCH DIMENSIONS WILL BE USED TO COMPLETE THE DESIGN OF THE OVERHEAD STRUCTURE.
3. FIELD VERIFICATION SHALL BE REQUIRED FOR ALL FOOTING ELEVATIONS AND GROUND SLOPES AT THE FOOTINGS, PER THE LATEST NCDOT STANDARD SPECIFICATION FOR ROADS AND STRUCTURES.
4. THE TOP OF THE FOOTING SHALL EXTEND AT LEAST 6 INCHES AND NOT MORE THAN 24 INCHES ABOVE THE HIGHEST POINT OF THE GROUND SURFACE AT THE FOOTING.
5. DESIGN AND CONSTRUCTION REQUIREMENTS FOR "PEDESTAL STRUCTURE CONSTRUCTION" SHALL MEET AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS.
6. CONTRACTOR SHALL VERIFY ALL UNDERGROUND UTILITY LOCATIONS BEFORE BEGINNING ANY UNDERGROUND WORK AND SHALL NOT DAMAGE ANY EXISTING UTILITIES.
7. MOUNT THE MVD UNIT TO THE DMS STRUCTURE BY A METHOD APPROVED BY THE STRUCTURE FABRICATOR OF RECORD FOR THE DESIGN OF THE DMS STRUCTURE.
8. ENSURE THE ATTACHMENT HEIGHT AND LOCATION OF THE MVD UNIT TO THE DMS STRUCTURE MEETS THE REQUIREMENTS OF THE MVD MANUFACTURER FOR OPTIMUM PERFORMANCE OF THE UNIT.

REMOTE LOCATION

Prepared in the Offices of:
NCDOT Mobility and Safety Division
750 N. Greenfield Pkwy., Garner, NC 27529

DMS #2 & MVD #2
NC 58 ADVANCED QUEUE DETECTION WARNING SYSTEM

DIVISION 02 CARTERET CO. CAPE CARTERET
PLAN DATE: NOVEMBER 2009 REVIEWED BY: I. N. AVERY
PREPARED BY: H.T. BERGGREN REVIEWED BY: G.A. FULLER, PE

REVISIONS	INIT.	DATE

SCALE 0

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A FULLER
SIGNATURE
DATE 11/23/09
CADD Filename: